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09/674,825	12/18/2000	Karina Rozhetsky	1659/3	5255

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Dr Mark Friedman LTD  
c/o Bill Polkinghorn-Discovery Dispatch  
9003 Florin Way  
Upper Marlboro, MD 20772

EXAMINER	
ZALUKAEVA, TATYANA	
ART UNIT	PAPER NUMBER

1713

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/674,825

Applicant(s)

ROZHETSKY, KARINA

Examiner

Tatyana Zalukaeva

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9, 13-31, 35-40 and 44 is/are pending in the application.
- 4a) Of the above claim(s) 1-9, 11, 13-15, 33, 43 and 44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-31 and 35-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-9, 11, 13-31, 33-40, 43 and 44 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of claims 16-31, 33-40, 43 and 44 in the reply filed on 01/17/2005 is acknowledged. The traversal is on the ground(s) that claims 14 and 15 properly belong to Group II because they are directed towards production of particulate matter of carboxyl cationite. This is not found persuasive because claims 14 and 15 depend on claim 1 that recite a process different from the process described in claim 16, per reasons set forth in the restriction requirement.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 1-9, 11, 13-15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

### ***Claim Objections***

3. Claim 33 is objected to under 37 CFR 1.75(c), as being of improper dependent form the cancelled claim. Accordingly claim 33 has not been further treated on the merits. Claims 43 and 44 depend on the non-elected claim 2, and have been also withdrawn from consideration.

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 16-31 are rejected under 35 U.S.C. 102(a) as being unpatentable over Kuznetsova et al (U.S. 4,120,831) in view of Heilmann et al (U.S. 5,336,742).

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Kuznetsova discloses a process for producing carboxyl cationites. In terms of the steps of the process they are:

a) dissolving **monovinyl monomers**, such as acrylic acid, methacrylic acid and vinyl containing amide, such as vinyl-containing amide such as hexahydro-1,3,5-triacryloyl triazine, N, N'-methylenediacrylamide, N,N'-ethylenedimethacrylamide or N, N'-hexamethylenedimethacrylamide as well as an initiator of radical polymerization in a **5-50% acetic acid**. Weight ratio between the unsaturated carboxylic acid and vinyl-containing amide is varied from 3:1 to 12:1; concentration of said comonomers in a 5-50% acetic acid is varied within the range of from 10 to 30%.

b) The resulting reaction mixture is dispersed.

Thereafter, copolymerization is effected in a suspension at a temperature ranging from 20-100°C (see abstract).

In some embodiments the reaction mixture prior to its dispersion is **prepolymerized at temperatures 20-25°C**, thus performing the polymerization without the use of a dispersing medium. (col. 3, lines 25-31).

Among other initiators it is advisable according to Kuznetsova to use **ammonium persulfate ascorbic acid** (col. 3, lines 32-36).

In order to produce **carboxyl cationites** with maximal pore dimensions while retaining the necessary hydrodynamic properties, Kuznetsova employs a **5 to 20% acetic acid at the concentration of comonomers in the latter equal to 20%**.

Furthermore, the use of acetic acid of a 5-20% concentration as a solvent for the

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starting comonomers makes it possible to produce **carboxyl cationites** possessing an insignificant change of volume in the swollen state (by 1.2-1.8 times) when transformed from the hydrogen form into the hydrogen-sodium form upon changing the pH value from 4 to 7, i.e. under the conditions of the sorption-desorption process (col. 3, lines 14-25).

Although Kuznetsova uses the dispersing medium in some embodiments, she describes the **prepolymerization**, wherein the polymer is used under the conditions identical to those instantly claimed out of comonomers, as instantly claimed **prior to** using the dispersing medium.

The transitional term "comprising" in claim 16, which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited method steps. See, e.g., *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) ("Comprising" is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.); *MoleculonResearch Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *In reBaxter*, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948).

Kuznetzova differs from the instant claims by not disclosing dispersing media as alcohol solution. Alcohols are notoriously used in the art of dispersion polymerization, as components of dispersing media. This is confirmed by the disclosure of Heilmann, as follows: "As is well known to one skilled in the art of dispersion polymerization, an inert

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diluent or dispersing medium must be chosen which will dissolve the monomer or monomer mixture but will precipitate the polymer as it forms. This presents a particular problem when preparing crosslinked polymers, since they are insoluble in all solvents. Therefore a dispersing medium must be chosen which will favor the separation of discrete particles during the polymerization process rather than formation of a crosslinked mass. A useful concept to aid in the determination of dispersing media or in choosing appropriate monomer mixtures which may be dispersion polymerized in a particular medium is the concept of solubility parameter. Tables of solubility parameter values for many solvents and some polymers, as well as methods for the estimation of solubility parameter values for polymers and copolymers, can be found in Polymer Handbook, J. Brandrup and E. H. Immergut, Editors, 2nd Edition, Wiley, New York, 1975, p. IV-337ff. In general, for a successful dispersion polymerization, the solubility parameter of the dispersing medium and of the polymer being formed should differ by at least about 1 to 1.5 solubility parameter units, preferably by 1.5 to 2 or more solubility parameter units. Therefore, for most monomer mixtures, solvents useful as dispersing media include nonpolar hydrocarbons such as pentane, hexane, petroleum ether, cyclohexane, and toluene, and the polar, hydroxylic solvents ***such as the alcohols methanol, ethanol, isopropanol, and t-butanol.*** Therefore, it would have been obvious to those skilled in the art at the time the invention was made to utilize an alcohol as a part of dispersing media in the process of Kuznetzova, because will favor the separation of discrete particles during the polymerization process rather than formation of a crosslinked mass, which is essential for preparation of crosslinked polymers.

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6. Claims 35-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuznetsova.

Kuznetsova does not specifically recite the step of dispersing polymer in the aqueous solution of inorganic salt. However, Kuznetsova teaches the conversion of polymer in the H-form to a polymer in the hydrogen-sodium form, i.e. from pH 4 to pH 7 (see col.1, lines 60-65). For this step it is obvious and known in the art to treat the polymer with the solution of inorganic salt, and is therefore reasonably expected as a step in Kuznetsova that is not specifically pronounced.

7. Claims 16-31, 35-40 stand rejected under 35 U.S.C. 102(b) as being anticipated by Bolto et al (U.S. 3,941,724).

Bolto discloses manufacturing an amphoteric polymeric composition which process comprises firstly polymerizing a mixture comprising a monomer containing a basic group and a monomer containing an acidic group, in the presence of a solvent system comprising formic acid (see abstract). Preferably the third monomer is di-functional and acts as a crosslinking agent, leading to extension of the polymeric network. Suitable crosslinking agents are, for example, ethylene glycol dimethacrylate, 1,3-butylene glycol dimethacrylate, divinylbenzene, **triallyl cyanurate**, the triallyl ether of pentaerythritol and the like (col. 7, lines 22-30).

The process of Bolto can be carried out with the use of another solvent in addition to a formic acid, such solvents as water, **ethanol, methanol, propanol,**

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dimethylformamide, etc, the list of solvents is given in col. 2, lines 42-50 and col. 4, lines 60-62.

Among preferred cationic monomers are acrylic and methacrylic acid (col.3, line 60). Free radical initiators are utilized to initiate the polymerization , such initiators include potassium persulfate, different peroxides and azocompounds, the list of those is presented in col. 4, lines 49-68) . After polymerization takes place grinding and sieving is performed (col. 5, lines 44-46). Following polymerization and washing to remove low molecular weight material, it is preferable to subject the product resin in particulate form to a pH equilibration treatment to achieve the optimum ion-exchange performance. Normally, this simply involves stirring the resin in an aqueous salt solution at room temperature and adding sodium hydroxide until the desired pH level is obtained, care being taken to ensure that the final equilibrium salt concentration employed is that of the water to be treated by the desalination process. For purposes of evaluation, however, the resin may be washed with hot water to obtain it in a regenerated form, and the amount of salt taken up by stirring the regenerated resin in salt solution at room temperature used as a measure of the effective capacity of the system. The time necessary to achieve salt uptake equivalent to 50% of the equilibrium level (the "half time") may be used as a convenient measure of the rate of salt adsorption (col. 6, lines 17-38). With specific regard to treatment with inorganic salt solution, see col.8, lines 22, 23.

With specific regard to a polymerization in the presence of acetic acid in lieu of formic acid Bolto carries out such experiment in order to evaluate the effective capacity



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of a resin obtained in the presence of other solvents , such as acetic acid (see Table in Example 2, col. 8). Therefore, the use of acetic acid as a major component (in lieu of formic acid) is also described by Bolto.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tatyana Zalukaeva whose telephone number is (571) 272-1115. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tatyana Zalukaeva  
Primary Examiner  
Art Unit 1713

March 24, 2005

